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| 10/596,642 | 03/07/2007 | Alan Smith | 713-1422 | 8736 |
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| EXAMINER ZOLLINGER, NATHAN C | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/596,642

Applicant(s)

SMITH, ALAN

Examiner

NATHAN ZOLLINGER

Art Unit

3746

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-15, 17-24, 27 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-15, 17-24, 27, 29, 30 and 32-35 is/are rejected.
- 7) ☒ Claim(s) 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20100803
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Detailed Action

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 30, 2010 has been entered.

Election/Restrictions

Examiner has reviewed Applicant's traverse of the restriction filed pertaining to claim 32 of the application. Based on these arguments and amendments that Applicant has made, Examiner hereby withdraws the restriction. Claim 32 will therefore be examined in this Office Action.

Response to Amendment

The amendment filed on April 7, 2010 has been entered. Claims 12, 27, 29-32 have been amended. Claims 33-35 are newly added and claim 28 is cancelled. In light of Applicant's amendments, Examiner withdraws all previous 112 rejections.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

Claim 32 is objected to because of the following informalities: The preamble improperly reads "A as claimed..." Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Zirps (US 5,588,817).

Claim 33: Zirps discloses a pump comprising a constant velocity cam (15) driven by a rotary shaft; first and second cylinders (11, 12, specifically, 20); first and second pistons (13, 14) reciprocable rectilinearly in the respective first and second cylinders; first and second cam followers (T-shaped end of pistons 13 and 14 which contact the cam) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons, respectively, for converting rotary motion of the constant velocity cam into reciprocatory motion of said first and second pistons 180° out of phase with one another; and at least one spring (15) simultaneously urging both said cam followers toward each other to engage the cam surface of said constant

velocity cam; wherein an entirety of the at least one spring is moveable relative to the first and second cylinders (Fig. 1).

Claim 35: A pump as claimed in claim 33, wherein said at least one spring is a tension spring (15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirps (US 5,588,817) in view of Mohr (US 4,597,717).

Claim 12: Zirps discloses a pump comprising an electric motor (col. 2, lines 44-45) having a rotary output shaft; first and second cylinders (11, 12, specifically 20); first and second pistons (13, 14) reciprocable rectilinearly in the respective first and second cylinders; a constant velocity cam (16) driven by the rotary output shaft; and first and second cam followers (T-shaped end of pistons 13 and 14 which contact the cam) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons, respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons 180° out of phase with one another; wherein said first and second cam followers are interconnected by a spring arrangement (15) simultaneously urging both said cam followers toward each other to

engage the cam surface of said constant velocity cam; and wherein an entirety of the spring arrangement is moveable following rotary motion of said constant velocity cam (Fig. 1). Zirps does not disclose a motor which is an A.C. motor. Mohr teaches a piston-type pump which uses an A.C. motor (col. 5, lines 5-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ an A.C. motor as taught by Mohr into the pump of Zirps since such a motor is very common and therefore easily replaceable if damaged.

Claim 13: Zirps and Mohr teach the limitations of claim 12, discussed previously. Zirps also discloses a pump wherein said first and second pistons are axially aligned (Fig. 1).

Claim 14: Zirps and Mohr teach the limitations of claim 13, discussed previously. Zirps also discloses cam followers engaging said constant velocity cam at opposite ends of a diameter of the circle of rotation of said cam (Fig. 1).

Claims 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirps (US 5,588,817) in view of Mohr (US 4,597,717) and in further view of Lehrke (US 5,145,339).

Claim 15: Zirps and Mohr teach the limitations of claim 12, discussed previously. Zirps does not disclose cam followers which are rollers. Lehrke discloses cam followers which are rollers (Fig. 3, 24). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ rollers as taught by Lehrke into the pump of Zirps in order to reduce friction losses between the cam and the followers.

Claim 21: Zirps and Mohr teach the limitations of claim 12, discussed previously. Zirps does not disclose a reduction gearbox interposed between an output shaft of a motor and a constant velocity cam. Lehrke discloses a reduction gearbox (section or part 12 in which gear 16 resides) interposed between an output shaft of a motor and constant velocity cam. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a reduction gearbox as taught by Lehrke into the pump of Zirps in order to produce a higher torque output for the pump.

Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zirps (US 5,588,817) in view of Mohr (US 4,597,717) and in further view of Yarger (US 3,150,603).

Claim 19: Zirps and Mohr teach the limitations of claim 12, discussed previously. However, Zirps does not teach a pump further comprising including third and fourth pistons, cylinders, or a second cam. Yarger teaches a pump with third and fourth pistons (15-18), cylinders (11-14), and a second cam (20, 20') which operates in accordance with Applicants limitations (col. 2, lines 21-31, 56-62; col. 3, lines 20-35). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ additional pistons as taught by Yarger into the pump of Zirps in order to increase fluid output.

Claim 20: Zirps, Mohr and Yarger teach the limitations of claim 19, discussed previously. However, Zirps does not teach a pump further comprising a liquid discharged from said first, second, third and fourth cylinders is supplied to a common

pressure loop. Yarger teaches liquid disclose from all the cylinders is supplied to a common pressure loop (Figs. 1-2).

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zirps (US 5,588,817) in view of Mohr (US 4,597,717) and in further view of Kettering (US 1,512,029).

Claim 22: Zirps and Mohr teach the limitations of claim 12, discussed previously. However, Zirps does not teach a flywheel incorporated in the drive transmission. Kettering teaches a pump which utilizes a flywheel (39). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a flywheel as taught by Kettering into the pump of Zirps so that "energy may be stored for steadying the action of the pump" (page 2, lines 5-8).

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zirps (US 5,588,817) in view of Mohr (US 4,597,717) and in further view of Krohn (US 4,009,971).

Claim 23: Zirps and Mohr teach the limitations of claim 12, discussed previously. However, Zirps does not teach a pump wherein each piston is arranged to have a stroke of 30 to 80mm. Krohn teaches a pump which has a stroke of 1.5 inches (col. 5, lines 10-13). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ the stroke length as taught by Krohn into the pump of Zirps in order to adapt the pump for a narrow space constraint in which the piston is allowed to oscillate.

Claims 12 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scheibel (US 6,280,162) in view of Mohr (US 4,597,717) and in further view of Bowen (US 3,816,029).

Claim 12: Scheibel discloses a pump comprising a rotary output shaft (connected to 12); first and second cylinders (2, 3); first and second pistons (6, 7) reciprocable rectilinearly in the respective first and second cylinders; a constant velocity cam (12) driven by the rotary output shaft; and first and second cam followers (ends of pistons 6, 7 which contact the cam) which, together with the constant velocity cam, couple (col. 2, lines 41-43) the rotary output shaft to said first and second pistons, respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons 180° out of phase with one another; wherein said first and second cam followers are interconnected by an arrangement simultaneously urging both said cam followers toward each other to engage the cam surface of said constant velocity cam (col. 2, lines 41-43). Scheibel does not disclose a spring arrangement which is entirely movable following rotary motion of said constant velocity cam. Bowen teaches a spring arrangement which is entirely movable following rotary motion of said constant velocity cam (Fig. 2, 133; col. 5, lines 15-17). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a spring arrangement as taught by Bowen in order to urge the cam followers into contact with the cam (Fig. 2, col. 5, lines 15-17). Scheibel also does not disclose an A.C. motor. Mohr teaches a piston-type pump which uses an A.C. motor (col. 5, lines 5-7). It would have been obvious at the time the invention was made to a person having ordinary skill

in the art to employ an A.C. motor as taught by Mohr into the pump of Scheibel since such a motor is very common and therefore easily replaceable if damaged.

Claims 17-18: Scheibel, Mohr and Bowen teach the limitations of claim 12, discussed previously. Bowen further discloses brackets (127) and compression/tension springs (133, Examiner notes that a coil spring can be considered to be a compression OR tension spring) and said first and second cam followers are directly interconnected and are simultaneously urged to engage the cam surface of said constant velocity cam by said compression springs (Fig. 2, col. 5, lines 15-17).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schmitt (US 5,573,386) in view of Mohr (US 4,597,717).

Claim 12: Schmitt discloses a pump comprising an electric motor (col. 3, lines 4-5) having a rotary output shaft (8); first and second cylinders (4, 5); first and second pistons (6, 7) reciprocable rectilinearly in the respective first and second cylinders; a constant velocity cam (9) driven by the rotary output shaft; and first and second cam followers (23, 24) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons, respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons 180° out of phase with one another; wherein said first and second cam followers are interconnected by a spring arrangement (11, 29) simultaneously urging both said cam followers toward each other to engage the cam surface of said constant velocity cam; and wherein an entirety of the spring arrangement is moveable following rotary motion of said constant velocity cam (Fig. 1). Schmitt does not disclose a motor which is an A.C. motor. Mohr

teaches a piston-type pump which uses an A.C. motor (col. 5, lines 5-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ an A.C. motor as taught by Mohr into the pump of Schmitt since such a motor is very common and therefore easily replaceable if damaged.

Claim 12 is rejected under under 35 U.S.C. 103(a) as being unpatentable over Lehrke (US 5,145,339) in view of Mohr (US 4,597,717) and in further view of Bowen (US 3,816,029).

Claim 12: Lehrke discloses a pump comprising an electric motor (col. 1, lines 59-61; col. 3, lines 7-8) having a rotary output shaft (14); first and second cylinders (Fig. 1, sleeves around pistons); first and second pistons (34) reciprocable rectilinearly in the respective first and second cylinders; a constant velocity cam (18) driven by the rotary output shaft; and first and second cam followers (20, 24) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons (Figs. 1, 3), respectively, for converting rotary motion of the output shaft into reciprocatory motion of said first and second pistons 180° out of phase with one another (Fig. 3a); wherein said first and second cam followers are interconnected by an arrangement (60) simultaneously urging both said cam followers toward each other to engage the cam surface of said constant velocity cam; and wherein an entirety of the arrangement is moveable following rotary motion of said constant velocity cam (Fig. 3). Lehrke does not disclose a spring arrangement. Bowen discloses a spring arrangement (133, Fig. 2). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a spring arrangement into the pump of

Lehrke in order to facilitate the user employing varying coupling tensions upon the cam followers and to facilitate easier disassembly/assembly of the piston pump arrangement. Lehrke also does not disclose a motor which is an A.C. motor. Mohr teaches a piston-type pump which uses an A.C. motor (col. 5, lines 5-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ an A.C. motor as taught by Mohr into the pump of Lehrke since such a motor is very common and therefore easily replaceable if damaged.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke (US 5,145,339) in view of Mohr (US 4,597,717) and Bowen (US 3,816,029) and in further view of Krohn (US 4,009,971).

Claim 23: Lehrke a, Mohr and Bowen teach the limitations of claim 12, discussed previously. However, Lehrke does not teach a pump wherein each piston is arranged to have a stroke of 30 to 80mm. Krohn teaches a pump which has a stroke of 1.5 inches (col. 5, lines 10-13). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ the stroke length as taught by Krohn into the pump of Lehrke in order to adapt the pump for a narrow space constraint in which the piston is allowed to oscillate.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke (US 5,145,339) in view of Mohr (US 4,597,717) and Bowen (US 3,816,029) and in further view of Krohn (US 4,009,971).

Claim 24: Lehrke, Mohr, Bowen and Krohn teach the limitations of claim 23, discussed previously. Lehrke does not disclose a piston with a diameter between 60

and 150 mm. Lehrke teaches a piston with a diameter of 1 inch (col. 16, line 39). It would have been obvious matter of design choice to increase the size of the piston diameter as taught by Lehrke, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237, (CCPA 1955).

Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke (US 5,145,339) in view of Mohr (US 4,597,717), Bowen (US 3,816,029) and Krohn (US 4,009,971) and in further view of Myers (3,471,079).

Claim 27: Lehrke, Mohr, Bowen and Krohn teach the limitations of claim 24, discussed previously. Lehrke does not disclose a guide rail. Myers teaches a guide rail (48). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a guide rail as taught by Myers into the pump of Lehrke in order to maintain the motion of the pistons in a horizontal direction (col. 3, lines 65-67).

Claim 29: Lehrke, Mohr, Bowen, Krohn and Myers teach the limitations of claim 27, discussed previously. Lehrke does not disclose two rails or first and second follower sliders. Myers further teaches two rails (48) as well as first and second follower sliders (50).

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lehrke (US 5,145,339) in view of Mohr (US 4,597,717), Bowen (US 3,816,029), Krohn (US 4,009,971) and Myers (3,471,079) and in further view of McIlroy (US 3,369,532).

Claim 30: Lehrke, Mohr, Bowen, Krohn and Myers teach the limitations of claim 29, discussed previously. Lehrke does not disclose a captive ball joint for a cam follower. McIlroy teaches a captive ball joint (32) for a cam follower. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ a ball joint as taught by McIlroy into the pump of Reese in order to simplify the connection design (i.e., reduce the number of parts since an extra pin or fixing bolt would not be necessary).

Claims 33-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Lehrke (US 5,145,339) in view of Mohr (US 4,597,717) and in further view of Bowen (US 3,816,029).

Claim 33: Lehrke discloses a pump comprising a constant velocity cam (18) driven by a rotary shaft (14); first and second cylinders (Fig. 1, sleeves around pistons); first and second pistons (34) reciprocable rectilinearly in the respective first and second cylinders; first and second cam followers (20, 24) which, together with the constant velocity cam, couple the rotary output shaft to said first and second pistons (Figs. 1, 3), respectively, for converting rotary motion of the constant velocity cam into reciprocatory motion of said first and second pistons 180° out of phase with one another (Fig. 3a); and at least one coupling (60) simultaneously urging both said cam followers toward each other to engage the cam surface of said constant velocity cam; wherein an entirety of the at least one spring is moveable relative to the first and second cylinders (Fig. 1). Lehrke does not disclose a spring. Bowen discloses a spring (133, Fig. 2). It would have been obvious at the time the invention was made to a person having ordinary skill

in the art to employ a spring arrangement into the pump of Lehrke in order to facilitate the user employing varying coupling tensions upon the cam followers and to facilitate easier disassembly/assembly of the piston pump arrangement. Lehrke also does not disclose a motor which is an A.C. motor. Mohr teaches a piston-type pump which uses an A.C. motor (col. 5, lines 5-7). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ an A.C. motor as taught by Mohr into the pump of Lehrke since such a motor is very common and therefore easily replaceable if damaged.

Claims 34-35: Lehrke, Mohr and Bowen teach the limitations of claim 33. Bowen further teaches a pump wherein at least one spring is a tension/compression spring (133).

Allowable Subject Matter

Claims 31 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN ZOLLINGER whose telephone number is 571-270-7815. The examiner can normally be reached on Monday - Thursday, 9 a.m. - 4 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art
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